

## Lab 1.

Develop a Java program that prints all real solutions to the quadratic equation  $ax^2 + bx + c = 0$ . Read in a, b, c and use the quadratic formula. If the discriminate  $b^2 - 4ac$  is negative, display a message stating that there are no real solutions.

```
import java.util.Scanner;
class QE
{
    public static void main(String xx[])
    {
        Scanner sc= new Scanner(System.in);
        System.out.println("Enter value a : ");
        double a = sc.nextDouble();
        System.out.println("Enter value b : ");
        double b = sc.nextDouble();
        System.out.println("Enter value c : ");
        double c = sc.nextDouble();

        double d = b*b-4*a*c;
        if(d>0)
        {
            double r1= (-b+Math.sqrt(d))/(2*a);
            double r2= (-b-Math.sqrt(d))/(2*a);
            System.out.println("The roots are real and distinct");
            System.out.println("Roots are "+r1+" and "+r2);
        }
        else if(d==0)
        {
            double r = -b/(2*a);
            System.out.println("Roots is "+r);
        }
        else
            System.out.println("There are no real solutions");
    }
}
```

```
C:\Users\sammj\OneDrive\Desktop\JAVA LAB\lab 1>java QE
Enter value a :
1
Enter value b :
2
Enter value c :
3
There are no real solutions
```

```
C:\Users\sammj\OneDrive\Desktop\JAVA LAB\lab 1>java QE
Enter value a :
1
Enter value b :
2
Enter value c :
1
Roots is -1.0
```

```
C:\Users\sammj\OneDrive\Desktop\JAVA LAB\lab 1>java QE
Enter value a :
2
Enter value b :
6
Enter value c :
2
The roots are real and distinct
Roots are -0.3819660112501051 and -2.618033988749895
```

005 lab

1. Develop a Java Program that prints all real solutions to the quadratic equation  $ax^2 + bx + c = 0$ .  
Read in  $a, b, c$  and use the quadratic formula. If the discriminant  $b^2 - 4ac$  is negative, display a message stating that there are no real solutions.

```
import java.util.Scanner;
```

```
public class Q5
```

```
{
```

```
    public static void main (String[] args)
```

```
    {
```

```
        Scanner s = new Scanner(System.in)
```

```
        System.out.println("Enter value a");
```

```
        double a = s.nextDouble();
```

```
        System.out.println("Enter value of b");
```

```
        double b = s.nextDouble();
```

```
        System.out.println("Enter value of c");
```

```
        double c = s.nextDouble();
```

```
        double d = b*b - 4*a*c;
```

```
        if (d > 0)
```

```
        {
```

```
            double x1 = (-b + Math.sqrt(d)) / (2*a);
```

```
            double x2 = (-b - Math.sqrt(d)) / (2*a);
```

```
            System.out.println("The roots are real and distinct");
```

```
            System.out.println("Roots are " + x1 + " and " + x2);
```

```
        }
```

```
        else if (d == 0)
```

```
        {
```

```
            double q = -b / (2*a);
```

```
            System.out.println("Root has one real sol");
```

```
            System.out.println("Root is " + q);
```

```
        }
```

```
        else { System.out.println("There are no real solutions");
```

```
        }
```

```
    }
```

```
}
```

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Output for program:

Enter value of a: 1

Enter value of b: 2

Enter value of c: 3

There are no real solutions

Enter value of a: 1

Enter value of b: 2

Enter value of c: 1

Roots have one real solution

Root is: -1

Enter value of a: 2

Enter value of b: 6

Enter value of c: 2

Roots are real and distinct: -0.88196 and ~~-2.6~~ -2.618033